

Claims

1. A mandrel for producing a glass tube or rod, comprising a self-supporting metal material jacket (22).
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2. The mandrel according to claim 1, wherein the self-supporting metal jacket (22) comprises an outer wall and an inner self-supporting structure.
3. The mandrel according to claim 2, wherein the inner self-supporting structure
10 comprises at least one support strut.
4. The mandrel according to claim 2 or 3, wherein the inner self-supporting structure comprises at least one thrust or annular ring.
- 15 5. The mandrel according to claim 2, 3 or 4, wherein the inner supporting structure is an embossed or corrugated plate made of a metal material substantially similar to the metal material of the outer wall.
- 20 6. A mandrel for producing a glass tube or rod, comprising,
a body (1) comprising a ceramic composite material, and
an external metal material jacket (2) surrounding at least a portion of said
body,
wherein the ceramic composite material has a substantially similar thermal
expansion coefficient as the metal material of said jacket.
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7. The mandrel according to claim 6, wherein the ceramic composite material is a
bonded material.
8. The mandrel according to claim 6 or 7, wherein the ceramic composite material is a
30 casting slip material.

9. The mandrel according to claim 6, 7 or 8, wherein the ceramic composite comprises $\text{MgO-MgAl}_2\text{O}_4$.
10. The mandrel according to claims 6, 7, 8, or 9, wherein the body (1) and the metal jacket (2) comprise at least a portion with an essentially cylindrical shape.
11. The mandrel according to claims 6, 7, 8, 9, or 10, wherein the body (1) and the metal jacket (2) comprise at least a portion with conical shape.
12. The mandrel according to any of claims 6 to 11, wherein the entire body (1) and the metal jacket (2) comprise a conical shape.
13. The mandrel according to any of claims 6 to 12, wherein the body (1) and the metal jacket (2) is cylindrical at the rear end portion and conical at the front end portion.
14. The mandrel according to any of the preceding claims, wherein the mandrel (42) comprises at the rear end a biasing means adapted to assure a tight fit between the body (1) and the jacket (22).
15. The mandrel according to any of the preceding claims, wherein the mandrel (42) is axially symmetrical along its longitudinal axis.
16. The mandrel according to any of the preceding claims, wherein the mandrel (42) is a Danner blowpipe/tube or Danner sleeve.
17. The mandrel according to any of the preceding claims, wherein the mandrel (42) provides an inner channel for blowing gas through and allows treating the inside surface of the glass tube with at least one gas.
18. The mandrel according to any of the preceding claims, wherein the metal material comprises a PGM material.

19. The mandrel according to any of the preceding claims, wherein the metal material comprises platinum alloy.
20. The mandrel according to any of the preceding claims, wherein the metal material
5 comprises an oxide dispersion strengthened platinum alloy.
21. The mandrel according to claim 20, wherein the metal material comprises 0.1 to 0.5, and more preferably 0.16 wt.-% of zirconium and/or yttrium oxide.
- 10 22. The mandrel according to any of the preceding claims, wherein the metal material jacket comprises a coating which upon contact with an inside surface of the tube being produced is released and accumulates on the inside surface to form a coating thereon.
- 15 23. The mandrel according to any of the preceding claims, wherein the mandrel (42) has a front end and a rear end with respect to the flow direction of the glass material and wherein the diameters from the rear end to the front end are equally conical or decreasing.
- 20 24. The mandrel according to any of the preceding claims, wherein the mandrel (42) comprises essentially at the front end a fixed bearing adapted to rotate the mandrel around said axis.
- 25 25. The mandrel according to any of the preceding claims, wherein the mandrel (42) comprises essentially at the rear end a floating bearing, adapted to rotate the mandrel (42) around said axis.
26. The mandrel according to any of the preceding claims, wherein the biasing means comprises at least one spring (6).
- 30 27. A system for producing a glass rod or tube with a Danner blow tube according to anyone of the preceding claims comprising further a nozzle for dispensing a flow of glass

to the surface of the Danner blowpipe at one end of said blowpipe at a relatively high temperature in order to form a glass film, which is removed or pulled at the other end in form of a tube.

- 5 28. A Method, particularly for producing a glass tube or rod with a Danner blow tube according to anyone of the preceding claims 1 to 27.
29. Use of the mandrel, the system and/or the method according to any of the respective preceding claims for producing a glass tube or rod.
- 10 30. Use according to claim 29 for a Danner process.